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Disentangling the mental health impact of childhood abuse and neglect: A replication and extension study in a Brazilian sample of high-risk youth

SELF-ARCHIVING VERSION

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Abstract

Childhood maltreatment is a key predictor of mental health problems across the life span. Yet, how maltreatment types independently and jointly influence the risk for psychiatric problems remains unclear. The aim of the study was two-fold: first, to replicate recent findings regarding the impact of maltreatment types on youth psychiatric symptoms, based on a Brazilian sample of high-risk adolescents (n= 347; age range=11-17yrs), and second, to extend existing findings by examining whether this relationship is mediated by bullying victimization and/or perpetration. Measures included self-report ratings of childhood maltreatment and peer victimization, as well as multi-informant reports of internalizing and externalizing symptoms. Consistent with prior research, we found that: (i) maltreatment types often co-occurred; (ii) there was a linear association between number of maltreatment types experienced and symptom severity (i.e. cumulative effect); and (iii) emotional abuse emerged as the most consistent independent predictor of poor mental health across domains, raters, and gender. Additionally, this study extends previous findings by showing that the influence of maltreatment on psychiatric outcomes is partially mediated by peer victimization, but not by bullying perpetration. In conclusion, these findings expand our understanding of the heterogeneity in individual responses to maltreatment as well as highlighting emotional abuse as an important predictor of poor mental health.

Keywords: childhood maltreatment; emotional abuse; adolescence; mental health; psychiatric symptoms; replication.

Introduction

Exposure to maltreatment is highly toxic for children's development and wellbeing (Cicchetti & Toth, 2005; McCrory & Viding, 2015). Indeed, maltreatment has been identified as one of the most potent predictors of psychiatric problems – including internalizing (e.g. anxiety, depression) and externalizing (e.g. antisocial behavior, substance use) symptoms – as well as associating with an earlier age of onset, greater symptom severity, higher comorbidity and poorer treatment response (Hovens et al., 2010; Hovens, Giltay, Wiersma, Spinhoven, Penninx, & Zitman, 2012). Consequently, childhood maltreatment is recognized as a key target for prevention and intervention efforts. However, one of the main challenges in research and clinical practice is the heterogeneity of individual responses to maltreatment. In other words, although a strong, *probabilistic* association between maltreatment and poor mental health is evident at the population level, individuals who have experienced maltreatment vary greatly in the type, severity, course, and presentation of symptomatology – with many showing significant resilience (Cicchetti, 2013). Unpacking this multifinality (i.e. when the same risk factor associates with multiple, different outcomes) is a critical step for informing risk-assessment, treatment formulation and the development of more targeted prevention strategies (Chicchetti & Rogosh, 1996).

One factor that may contribute to multifinality is the type of maltreatment experienced; that is, whether the effects of distinct forms of abuse and neglect are specific or shared across mental health domains. So far, the empirical literature has been mixed, with different studies reporting (i) specific (*unique variance*), (ii) non-specific (*shared variance*), and (iii) number-dependent (*cumulative*) associations between maltreatment types and psychiatric symptoms. For example, several studies have provided evidence of unique influences of maltreatment types on multiple levels of function, including molecular (e.g., Cecil, Smith, Walton, Mill, McCrory, & Viding, 2016), neurocognitive (Sheridan & McLaughlin, 2014) and behavioral function (e.g., Petrenko, Friend, Garrido, Taussig, & Culhane, 2012), with the most consistent evidence relating to the specific impact of physical abuse on externalizing difficulties (e.g. Litrownik et al., 2005; van der Put, Lanctot, de Ruiter, & van Vugt, 2015). In contrast, other studies have found that maltreatment types confer a broad and general vulnerability for psychiatric problems, such as anxiety, depression, and substance use (e.g. Norman, Byambaa, De, Butchart, Scott & Vos, 2012; Vachon, Krueger, Rogosch, & Cicchetti, 2015). Still another set of studies have reported that the number of maltreatment types experienced, rather than any specific type itself, may be a stronger predictor of psychiatric outcomes (i.e. cumulative effect; e.g. Finkelhor, Ormrod, &

Turner, 2009; Lauterbach & Armour, 2016). Indeed, a large body of evidence – starting with the seminal study by Felitti and colleagues (1998) – has demostrated a graded relationship between the number of Adverse Childhood Experiences reported and risk for mental and physical health problems across the lifespan.

In an effort to disentangle the mental health impact of child abuse and neglect, Cecil, Viding, Fearon, Glaser, & McCrory (2017) recently published a study characterizing the unique, shared and cumulative effects of five main types of maltreatment on a range of multi-rated mental health outcomes (i.e. self- and teacher/key worker-report). The study was based on a community sample of 204 high-risk youth (16-24 years, 53% female) from inner-city London, UK – the majority of whom reported experiencing at least one form of maltreatment while growing up (68%). Analyses controlled for a range of potential confounders, including socio-demographic characteristics, neighborhood deprivation and current levels of community violence exposure (CVE). Briefly, the authors found that: (i) maltreatment types were highly interrelated, with multi-type maltreatment occurring more commonly than single forms of maltreatment; (ii) exposure to a higher number of maltreatment types was linearly associated with greater symptom severity, consistent with a cumulative effect of maltreatment; and (iii) whereas maltreatment types were typically associated with all outcomes when examined in isolation (i.e. indicative of non-specific/generic effects), only emotional abuse emerged as the main independent predictor of symptom severity when all maltreatment types were examined together (i.e. indicative of unique effects). Furthermore, follow-up analyses showed that the effect of emotional abuse on outcomes was comparable for boys and girls, and was partially mediated by CVE.

The authors also noted several limitations, including the modest sample size, the need for replication and the inability to tease apart which aspect of CVE may have mediated the effects of maltreatment; that is, whether this may be due to violence victimization and/or perpetration. Indeed, based on this study alone, it is not possible to establish the extent to which findings may have been specific to the study characteristics, confounded by unmeasured variables and biased by random or systematic error. Cross-cohort replication is increasingly encouraged in the field of child development and mental health as a valuable method for testing the robustness of findings, evaluating their generalizability to different settings and populations, and for strengthening causal inference – all of which are fundamental for informing policy and practice (Richmond, Al-Amin, Smith & Relton, 2014; Rutter & Pickles, 2016).

To this end, the present study had two main aims. First, to *replicate* findings from the UK study (Cecil et al., 2017), based on a larger, younger community sample of high-risk youth (n = 347; 11-17 years) recruited from a violent neighborhood in Salvador, Brazil. Specifically, we sought to closely mirror the analyses described in Cecil et al. (2017), using the same self-report measure of childhood maltreatment and multi-rated psychiatric outcomes (self- and parent-report), indexing the same domains of internalizing and externalizing problems but via the use of different instruments. In this respect, this study offers a stringent test of replication, considering that the two samples differ in confounding structure, sample characteristics and cultural context, as well as partially differing in rater combination and the instruments used to index psychiatric symptoms. Our second aim was to extend the UK findings by unpacking the mediation effect observed using a global measure of violence exposure. Specifically, we employed a more fine-tuned measure of current violence exposure to establish whether the association between childhood maltreatment and mental health outcomes may be mediated by being a victim vs a perpetrator of violence.

Methods

Participants

Participants were 347 adolescents aged 11-17 years old (M = 13.28; 48% female), who were part of a larger study (n = 363) and had complete data on childhood maltreatment. Participants were recruited from a public school in the suburbs of Salvador, capital of the State of Bahia, and one of the cities with the highest crime rates in Brazil (Waiselfisz, 2014). The school was located in a particularly deprived and violent urban area, between two competing communities for drug trade. Thus, adolescents from both communities attended the same school. The sample was ethnically diverse, with 44% *pretos* (African-Brazilians), 36% *pardos* (combined European, Native, and African Ancestry), 9% *brancos* (White Brazilians), 4% *amarelos* (Asian Brazilians), and 4% *indígenas* (Indigenous Brazilians) participants. Most families received governmental financial support in the form of a conditional cash transfer program called *Bolsa Família* ("Family Fund"). We refer to the sample as 'high-risk', given prior evidence that childhood maltreatment and psychiatric symptoms disproportionally affect children from disadvantaged and violent neighborhoods (Margolin & Gordis, 2000).

Procedure

This study was conducted in Brazilian Portuguese as part of a larger study to assess the efficacy of Group Trial-Based Cognitive Therapy, aiming to modify adolescents'

dysfunctional thinking in a school setting as a preventative universal approach offered in classrooms (de Oliveira et al., 2015). Data were collected in 2015, during the first and second school semesters. First, the city Education Secretary was contacted to indicate the school that should be used to start the project (pilot study). Second, the project was presented to the director and teachers. Third, groups of parents were invited to a 50-minute project information meeting. Parents who were not able to attend were contacted to explain the study individually or in small groups. Finally, students received information about the project in a 50-minute classroom meeting. After explaining the project, students were offered an alternative assignment if they chose not to participate, but no participants declined.

The study was approved by Maternidade Climério de Oliveira, part of the Institutional Review Board of the Federal University of Bahia. All participants signed the assent forms prior to participation. In addition, their parents signed the consent forms. Before participating in the Group Trial-Based Cognitive Therapy sessions, the students were asked to complete a demographic questionnaire along with measures of adversity and mental health. Additionally, parents or legal guardians were invited to report on the children's behavior. Parent reports were obtained for 274 participants (i.e. 79% of total sample). Trained interviewers were available to answer questions and provide clarifications when necessary. No compensation such as money or vouchers was offered. All data were collected in person during the child and parent testing sessions by means of pen and paper questionnaires.

Measures

Socio-demographic variables. Participants' legal guardians provided information on age, gender, ethnicity, and living conditions. To control for environmental deprivation experienced in daily life, we assessed the living condition of each participant using a checklist modified from the Brazilian Research Association (ABEP; 2013). Informants reported the number of nine common home possessions (i.e. televisions, radios, bathrooms, cars, vacuum cleaners, washing machines, video/dvd players, refrigerators, and freezers): 0 if the household possessed no item, 1 if the household possessed one item, and 2 if the household possessed two or more of the listed items. Scores were summed into a total *living condition* variable, ranging from 0 (worst condition) to 18 (Cronbach's alpha = .62).

Childhood maltreatment. The Brazilian Portuguese version of the Childhood Trauma Questionnaire (CTQ), was used to assess experiences of maltreatment "while growing up" (Bernstein & Fink, 1998). The CTQ is a well-validated, self-report questionnaire, comprising of 28 items ranging from 1 (never true) to 5 (very often true). Scores for each item are summed to yield the five subscale scores, resulting in a full scoring

range of 5-25 for each type of maltreatment. Coefficient alpha estimates obtained in the current study were: .31 (physical neglect), .61 (physical abuse), .68 (sexual abuse), .74 (emotional neglect), and .78 (emotional abuse). For a subset of analyses (e.g. calculating proportion of youth reporting maltreatment), subscales were examined as categorical variables based on severity thresholds provided by the CTQ manual (Bernstein & Fink, 1998) as None (or Minimal), Low (to Moderate), Moderate (to Severe) and Severe (to Extreme).

Peer victimization. The two global items of the Olweus Bully/Victim Questionnaire ("How often have you been bullied?" and "How often have you taken part in bullying other students?"), were used to assess the frequency of self-reported bullying victimization and perpetration over the past term (Olweus, 1994; Stallard et al., 2014). The items were coded as: 0= Never; 1= Once or twice; 2= Two or three times per month; 3= About once per week; 4= Several times per week.

Psychiatric symptoms. Psychiatric symptoms were assessed by means of self- and informant-report measures (i.e., parents). Informants completed the well-validated Brazilian Portuguese version (Bordin et al, 2013; Rocha et al, 2013) of the Child Behavior Checklist (CBCL/6-18; Achenbach & Rescorla, 2001). The CBCL/6-18 is a standardized questionnaire to identify emotional and behavioral problems in children and adolescents. In this study, trained interviewers were available to help parents fill in the CBCL/6-18. The Brazilian version of the well-validated self-report Children's Depression Inventory (CDI; Kovacs, 2004; Gouveia, Barbosa, Almeida, and Gaião, 1995) was used for assessing the presence and severity of depressive symptoms in school-aged children. It consists of 27 items, rated on a three-point scale (0-2), indexing symptoms occurring in the past 2 weeks. The item scores are summed to produce a total depression score ranging from 0 to 54, with higher scores indicating more severe symptoms (α = .87 in this sample). The Screen for Child Anxiety Related Disorders (SCARED; Birmaher et al., 1997; Birmaher, Brent, Chiappetta, Bridge, Monga, & Baugher, 1999; Isolan, Salum, Osowski, Amaro, & Manfro, 2011) was administered to measure anxiety symptoms. Out of a total of 41 items, 13 are related to panic/somatic symptoms, 9 to generalized anxiety, 8 to separation anxiety, 7 to social phobia and 4 to school avoidance. Each item was rated on a scale from never (0) to often (2; total score: 0 to 82). The Brazilian version of the SCARED has been shown to have good reliability and validity for assessing anxious symptoms (Isolan et al., 2011; α = .89 in this sample). Adolescents also reported on their drinking of alcohol, use of cannabis, and use of other street drugs over the past 6 months. Due to the low frequency of reported cannabis (any

use: n = 2) and other street drug (any use: n = 5) use over this period, only alcohol use was included in the analyses (never: n = 248; once or twice: n = 82; more than 2-4 times per month: n = 10; more than once per week: n = 7).

Statistical Analysis

Step 1. Replication. The replication analysis mirrored the three-steps procedure described in the UK study. First, we ran descriptive statistics to assess (i) bivariate correlations between maltreatment types and study variables (Pearson product-moment correlation coefficients for continuous study variables; point-biserial correlation coefficients for binary variables); and (ii) proportion of youth in the sample reporting single maltreatment types (regardless of co-occurrence) for each severity threshold (None, Low, Moderate and Severe), as well as multi-type maltreatment amongst maltreated youth (i.e. at least one form of maltreatment at or above the Low maltreatment severity threshold based on the CTQ manual; Bernstein & Fink, 1998).

Second, we examined the *cumulative effects* of maltreatment on mental health outcomes. Specifically, a measure of cumulative maltreatment was created by summing the number of maltreatment types experienced at or above the Low CTQ threshold. Then, a series of linear step-wise regressions (one for each mental health outcome) was performed, in which all covariates were included in the first block (age, gender, ethnicity, living condition), and the cumulative maltreatment score was included in the second block.

The final step was to examine the *unique vs shared effects* of maltreatment types on mental health. This analysis consisted of two different sets of step-wise multivariate regressions. In the first, each maltreatment type was included separately as a predictor (measured as a continuous variable to model the full range of exposure), after controlling for covariates (*individual models*). In the second, all five types of maltreatment were entered simultaneously as predictor variables, to assess whether any type of abuse or neglect was uniquely associated with the outcomes, above and beyond the effect of covariates as well as all other maltreatment types (*simultaneous models*). Contrasting individual vs. simultaneous models allowed to partition unique vs shared effects of maltreatment types on mental health outcomes. Statistical significance was established by examining the 95% confidence intervals (95% CI) of the unstandardized estimates and associated p values, while standardized estimates were used as a measure of effect size (Altman, Machin, Bryant & Gardner, 2013). Analyses were performed on SPSS package v. 21 (2012).

In addition to the primary analyses, we also mirrored the follow-up analyses presented

in the UK study: (i) *testing the incremental contribution of emotional abuse.* This involved re-running simultaneous models, but including covariates together with other types of maltreatment in the first block, and emotional abuse alone in the second block; (ii) *investigating gender as a potential moderator*. This involved carrying out an interaction analysis (controlling for covariates), to examine whether the effect of emotional abuse on symptom severity was moderated by gender; and (iii) *disaggregating forms of internalizing and externalizing symptomatology.* Here, we investigated whether the pattern of associations between maltreatment types and symptom severity remained consistent when examining specific forms of internalizing and externalizing problems.

Step 2. Extension. In the UK study, the effect of maltreatment on mental health was found to be mediated by CVE. However, because a global measure was used, it was not possible to test whether effects were driven by participants being *victims* and/or *perpetrators* of violence. Here, we extended analyses to address this question by simultaneously entering in the model multiple mediators that are related to peer victimization – being a victim vs. a perpetrator. The indirect effects were tested using the Preacher and Hayes' (2008) SPSS macro for bootstrapped mediation (INDIRECT). The macro generates unstandardized estimates for all paths in the mediation model, and applies bootstrapping (10,000 samples with replacement) to obtain bias-corrected 95% CI for indirect paths (Shrout & Bolger, 2002). Indirect effects are considered significant if the CIs do not cross zero. Mediation was only assessed for maltreatment types that emerged as significant unique predictors of mental health outcomes. All analyses controlled for covariates.

Results

Replication analyses

Step 1: Descriptive Statistics. The sample characteristics are shown in Table 1.

Associations between maltreatment types and study variables. Correlations with ethnicity, gender and age are presented in Table 1. Females reported higher emotional abuse, which was unique to our sample compared to the UK study. Higher living condition was negatively associated with emotional and physical neglect. With regards to peer victimization, both being a victim and a perpetrator significantly associated with all maltreatment types. Overall, the association between maltreatment types and mental health was stronger for self- vs. informant-reported symptoms. Finally, in line with the UK study, emotional abuse was the type of maltreatment most strongly associated with all outcomes.

********** Table 1 **********

Interrelationship between maltreatment types. As shown in Table 2, maltreatment

types were significantly inter-correlated. This is consistent with the UK study, although the range of correlations was weaker (r = .05 to .44, as opposed to .34 to .70 in the UK sample).
********** Table 2 **********

Proportion of youth reporting maltreatment. Table 3 displays the frequency of single and multi-type maltreatment. As with the UK study, emotional neglect was the most common type of maltreatment (*Brazil*: 45%; *UK*: 49%) whereas sexual abuse was the least frequently reported (*Brazil*: 11%; *UK:*15%). Overall, 72% of youth reported experiencing at least one form of maltreatment at or above the *Low* severity threshold (*UK:* 68%). Of these, the majority (62%) reported experiencing multiple types of maltreatment (*UK:* 72%). Emotional abuse was the only maltreatment type to differ in frequency by sex, with girls more likely to report across all severity thresholds ($X^2(3) = 16.28$, $p < .001$). No sex differences were observed in the proportion of youth reporting multi-type maltreatment ($p > .05$).
********** Table 3 **********

Step 2: Cumulative effects of maltreatment. Figure 1 shows the association between number of maltreatment types experienced and psychiatric symptoms, after controlling for covariates. Of note, due to the low number of youth experiencing five types of maltreatment (n = 5), this group was combined with those experiencing four types of maltreatment (n = 23) for this analysis. Like the UK sample, exposure to a greater number of maltreatment types was associated with more severe symptomatology across domains, and this effect was more pronounced for self- vs. informant-reported symptoms. In contrast to the UK study, however, this effect was only significant for self-reported (*depression*: *Std.B* = .55, $p < .005$; *anxiety*: *Std.B* = .28, $p < .005$; *alcohol use*: *Std.B* = .32, $p < .005$), but not informant-reported symptoms (i.e. internalizing and externalizing problems, $p > .10$).
********** Figure 1 **********

Step 3: Shared versus unique effects of maltreatment types

Individual models. Table 4 shows the associations between individual maltreatment types and mental health outcomes, after adjusting for covariates (but not for other types of maltreatment). Overall, the majority of maltreatment types were positively associated with symptom severity when examined in isolation, with more consistent and significant associations observed for self- vs. informant-reported outcomes. In line with the UK study, emotional abuse was the maltreatment type most robustly associated with symptom severity across all mental health domains (all p's < .01). Physical and sexual abuse were significantly associated with self-reported, but not informant-reported outcomes.

Simultaneous models. Also displayed in Table 4 are the results of the simultaneous models, whereby all maltreatment types were entered concurrently into the regression equations, after controlling for covariates. As with the UK study, emotional abuse was the most consistent *independent* predictor of symptom severity across mental health domains and reporters. However, in our study: (a) emotional abuse also independently predicted externalizing symptomatology; and (b) albeit less consistently, maltreatment types other than emotional abuse also independently associated with self-reported internalizing problems, particularly physical and sexual abuse. Physical neglect was least associated with outcomes.
********** Table 4 **********

Follow-up Analyses

Incremental contribution of emotional abuse. In line with the UK sample, we found that entering emotional abuse as a separate predictor, after accounting for covariates and other maltreatment types, resulted in a significantly improved model across the self-reported outcomes (*depression*: $\Delta R^2 = .12$, $F(9, 253) = 27.20$, $p < .005$; $R^2_{adj} = .49$, significant F change $p < .005$; *anxiety*: $\Delta R^2 = 0.08$, $F(9, 253) = 8.24$, $p < .005$; $R^2_{adj} = .20$, significant F change $p < .005$; *alcohol use*: $\Delta R^2 = .07$, $F(9, 253) = 6.85$, $p < .005$; $R^2_{adj} = .17$, significant F change= 22.66). While the incremental contribution of emotional abuse to informant-reported outcomes was also significant, overall models predicting these outcomes were not ($p > .05$).

Gender as a potential moderator. Although in this sample females were more likely than males to report experiences of emotional abuse, gender did not significantly moderate the influence of this type of maltreatment on outcomes (all p's > .10). In other words, consistent with the UK sample, the association between emotional abuse and symptom severity across domains was comparable for boys and girls.

Disaggregating forms of internalizing and externalizing symptomatology. Associations between maltreatment types and specific forms of internalizing and externalizing symptomatology are shown in the Supplementary Table. Again, based on *simultaneous* models, emotional abuse emerged as the most consistent independent predictor of symptom severity, with the strongest associations observed for informant-reported affective problems (*Std.B* = .20, $p < .01$) as well as self-reported GAD symptoms (*Std.B* = .31, $p < .001$) and panic/somatic problems (*Std.B* = .31, $p < .001$). Interestingly, the independent effect of emotional abuse on informant-report externalizing problems seemed to be primarily driven by associations with ODD symptoms (*Std.B* = .15, $p < .05$), since associations with ADHD and conduct problems were not significant ($p > .05$).

Rater concordance across studies. Across the analyses above, we found that associations between maltreatment and psychiatric outcomes were generally stronger for self- vs. informant-reports. While this is consistent with the UK study, rater differences were found to be more pronounced in the present study. To explore this discrepancy further, we compared the magnitude of correlations between self- and informant-reports across studies. We limited this analysis to internalizing problems, for which multi-rated data was available. We found that correlations between raters were stronger in the UK study (*depression: r* = 0.39, *p* = 4.76E-07; *anxiety: r* = 0.39, *p* = 2.76E-07), compared to the present study (*depression: r* = 0.25, *p* = 3.00E-05; *anxiety: r* = 0.15, *p* = 0.01). The difference in coefficients was significant for anxiety (i.e. significantly lower in the current study, compared to the UK study; Z = 2.60, *p* = 0.01) but not for depression (Z = 1.54, *p* = 0.12).

Post-hoc power analysis: The sample size in our study (n = 347) was larger than the UK study (n = 204). Nevertheless, we performed a post-hoc analysis to determine observed power, based on our statistical analyses. Using *G*Power*, we found that, for regression analyses with four covariates and up to five predictors (i.e. simultaneous models), we were able to detect small effect sizes of 0.05 and above with 80% power.

Extension Analysis: Peer victimization vs. perpetration as potential mediators

The last step of the analysis was to extend the UK study, by examining the potential mediating role of current levels of adversity (indexed here by peer victimization) in the relationship between maltreatment types and psychiatric symptoms. As Figure 2 illustrates, being a victim – but not a perpetrator – of peer victimization partially mediated the effect of emotional abuse on self-reported depression (*B* = .06, SE = .03, 95% CI = [.01, .14]) and anxiety (*B* = .20, SE = .07, 95% CI = [.08, .37]). The relationship between emotional abuse and informant-reported outcomes or self-reported alcohol use were not significantly mediated by either type of peer victimization (see Supplementary Figure). Given that physical abuse also emerged as an independent predictor of self-reported internalizing problems, we tested mediation for this type of maltreatment as well. Again, being a victim, but not a perpetrator of peer victimization partially mediated the effect of physical abuse on depression (*B* = .16, SE = .08, 95% CI = [.05, .37]) and anxiety (*B* = .50, SE = .18, 95% CI = [.23, .94]).

********** Figure 2 **********

Discussion

The aim of this study was to replicate and extend recent findings from Cecil et al (2017), by characterizing the *unique*, *shared* and *cumulative* effects of different types of childhood maltreatment on mental health, using data drawn from a high-risk sample of

Brazilian youth. In line with the UK study, we found that (i) maltreatment types often co-occurred, (ii) the number of maltreatment types experienced was linearly associated with symptom severity (especially for self-reported outcomes), and (iii) emotional abuse emerged as the most robust independent predictor of mental health, irrespective of rater, gender or symptom domain assessed. Overall, the use of different strategies to model maltreatment enabled us to reach complementary insights into the way that distinct types of abuse and neglect independently and additively impact mental health, both of which are important for understanding heterogeneity in maltreatment responses as well as informing research and clinical practice. In addition, we extended previous findings by showing that the influence of maltreatment on psychiatric symptoms (specifically self-reported internalizing problems) is partially mediated by peer victimization – but not bullying perpetration. Below, we discuss convergent, divergent and novel findings, concluding with implications and future directions.

Convergent findings between studies

An overview of key similarities and differences between study characteristics is provided in the Supplementary Text. We highlight here three main findings that were replicated across studies. First, in line with Cecil et al. and previous studies, we found that maltreatment types were interrelated and frequently co-occurred with one another (Herrenkhol & Herrenkohl, 2009). Emotional abuse and neglect were the most prevalent maltreatment types, while sexual abuse was the least frequently reported across studies. Overall, the majority of youth reported at least one type of maltreatment while growing up. Importantly, amongst youths who reported maltreatment, the experience of multi-type maltreatment was far more common than experiencing any one form of maltreatment alone. Together, these findings converge in showing the extent to which maltreatment types co-occur, and underscore the importance of comprehensively assessing multiple forms of maltreatment across research and clinical practice.

Second, the present findings support a *cumulative* effect of maltreatment on psychiatric symptoms. Consistent with the UK study, we observed that symptom severity linearly increased with the number of maltreatment types reported, and that this relationship was stronger for self- vs. informant-rated symptoms. This may reflect several factors, including (i) cross-rater discordance commonly observed in mental health research (Achenbach, Krukowski, Dumenci & Ivanova, 2005); (ii) inflation resulting from shared method variance (i.e. as maltreatment was also based on self-reports); and/or (iii) lower statistical power for informant-rated outcomes due to the reduced sample size compared to

self-reported outcomes. It is also possible that findings may reflect a greater sensitivity of self-report data in capturing youth mental health symptoms, particularly internalizing difficulties, which could be harder to detect by external raters.

Third, we replicated findings regarding the *unique* effect of emotional abuse on mental health. Specifically, we found that emotional abuse was independently associated with psychiatric symptoms over and above the influence of sociodemographic factors and other maltreatment types – an effect that was observed across all mental health domains, raters and sex. The fact that emotional abuse emerged as the most consistent and potent independent predictor of symptomatology across both studies, despite differences in sample characteristics, cultural context, confounding structure and outcome measures considerably adds confidence to this finding. It also supports previous studies that have reported an independent effect of emotional abuse on poor mental health and trauma-related symptoms (e.g. Arata, Langhinrichen-Rohling, Bowers, & O'Brien, 2007; Spertus, Yehuda, Wong, Halligan, & Seremetis, 2003; Sullivan, Fehon, Andres-Hyman, Lipschitz, & Grilo, 2006).

As with the UK study, the use of the CTQ did not allow to pinpoint specifically what aspect of emotional abuse may be driving these associations. The subscale comprises of five items – two that assess behaviorally specific actions related primarily to spurning/parental negativity (i.e. calling names, saying hurtful things), two that describe inner feelings that may not only occur in response to emotional abuse, but also to other types of maltreatment (i.e. feeling hated, thinking that parents wished they were never born) and one item relating to the participant's subjective appraisal of the experience (i.e. 'I believe I was emotionally abused'). Consequently, it is unclear whether the observed associations reflect something that is specific to emotional abuse, or whether they may index something that is more broadly intrinsic to all forms of maltreatment. Future research using in-depth assessments of emotional abuse will be needed in order to elucidate factors underlying the observed association between this type of maltreatment and mental health.

Divergent findings between studies

The findings from the present study also diverged from those of Cecil et al. in two main ways. First, although the association between childhood maltreatment and psychiatric symptomatology was stronger for self- vs. informant-report data across both studies, this difference was more pronounced in the current study. In fact, the association between maltreatment types and informant-reported outcomes (i.e. internalizing and externalizing difficulties) was not significant in our cumulative model, and associations were also generally

weaker in the independent and simultaneous models – particularly for physical and sexual abuse. These discrepancies may largely reflect the fact that the two studies collected data from different informants (*Brazil*: parents; *UK*: teachers/key workers). In follow-up analyses, we found that concordance between self- and informant-reports of internalizing symptoms was indeed higher in the UK study compared to ours. One reason for this may be that in the UK sample, informant-reports for the most vulnerable youth were collected by trained key-workers, who may have mirrored more closely self-reported psychiatric symptoms (in this case internalizing difficulties, which can be particularly difficult to detect), because of their greater experience and training in working with high-risk youth.

Second, our findings diverged somewhat when comparing individual and simultaneous models. Specifically, in the UK study, only emotional abuse remained a significant predictor when modeling maltreatment types simultaneously, pointing to an important role of shared variance in driving maltreatment effects on mental health. In the present study, associations were also found to generally decrease in magnitude between individual and simultaneous models; however, these differences were not as pronounced. This also means that, while emotional abuse was identified as the strongest and most consistent independent predictor of mental health (consistent with the UK study), it was not the *only* maltreatment type to show unique associations. These differences may be partly explained by the weaker correlations between maltreatment types in our study (i.e. *Brazil:* r = .05 – 0.44; *UK:* r = .29 – .70), pointing to a lower degree of shared variance. We also find a more prominent independent role of physical abuse in predicting internalizing difficulties.

Novel findings: Peer victimization as a mediator of maltreatment effects

In addition to the replication, we sought to extend the UK study findings by examining the potential role of peer victimization as a mediator of maltreatment effects on mental health. We found that the influence of childhood maltreatment (i.e. emotional and physical abuse) on psychiatric symptoms was mediated by peer victimization. Of interest, mediation effects were confined to self-report internalizing problems, and did not extend to externalizing problems. This is in line with the broader literature on bullying and peer victimization, which has documented a stronger effect on internalizing (vs externalizing) problems, including depression, anxiety and suicide risk, even after controlling for experiences of childhood maltreatment (Lereya, Copeland, Costello, & Wolke, 2015; Reijntjes, Kamphuis, Prinzie, & Telch, 2010) and applying stringent causal inference methods (Singham et al., 2017). Our findings are also consistent with previous studies

showing that peer victimization mediates the association between childhood maltreatment and internalizing symptoms (e.g. Baker & Bugay, 2011; Hamilton, Shapero, Stange, Hamlat, Abramson, & Alloy, 2013). Unlike previous studies, we also included bullying perpetration as a concurrent mediator, to test multiple mediation pathways related to being a victim vs. a perpetrator of peer violence. Our findings suggest that childhood maltreatment associates with higher risk for internalizing problems partly via increased vulnerability to victimization by peers, but not via increased infliction of harm toward peers.

Limitations and future directions

A number of the limitations outlined in the UK study also apply to this study. First, our measure of maltreatment (CTQ) was based on self-reports, which can be susceptible to retrospective biases (e.g., memory bias). In particular, self-report measures are unlikely to capture experiences of child maltreatment that occur very early in life (pre-verbal memories), which may still profoundly impact long-term functioning. Ideally, a combination of raters and official reports should be used. It is noteworthy, however, that findings showed consistency across both studies, adding confidence to the observed associations. Second, our measure precluded the possibility of establishing which specific aspects of emotional abuse were driving the observed effects on psychiatric symptomatology. In future, the use of more detailed measures of maltreatment, as well as the inclusion of potential mediating variables (e.g. self-worth, emotional regulation, availability of support) will mark an important step toward elucidating these associations further. Third, we were not able to examine potential moderators of maltreatment effects, such as maltreatment characteristics (e.g. age of onset, chronicity, and perpetrator relationship), and genetic factors. It is also important to note that the two studies focused on different age ranges characterized by distinct developmental phases, periods of biological maturation and psychosocial challenges, which should be considered when interpreting the present findings. Fourth, while the present replication supports a causal effect of maltreatment on mental health, it is important to note that results were based on cross-sectional and associational data.

In addition, some limitations were specific to this sample. Unlike the UK study, we did not measure IQ. Unfortunately, the failure to do so in our sample indicates that caution should be exercised in the interpretation of data. In Brazilian public schools, recruiting youth from general classrooms does not automatically exclude those with special needs/intellectual disability (i.e. IQ< 70), as only students with very severe disability receive special educational support. Another limitation specific to this study was the low internal consistency

of the physical neglect subscale (Chronbach alpha= .31). This low internal consistency (and lack of associations with psychiatric outcomes) might be due to the fact that some of the items included in the subscale may index more general poverty than intentional physical neglect. Consistent with this, a study validating the Brazilian translation of the CTQ using confirmatory factor analysis found that three of the five items included in the subscale showed low loadings on the latent structure of the physical neglect factor (Grassi-Oliveira et al., 2014). Finally, because parents were also summoned to provide information, participants may have been unwilling to disclose drug use, which might explain the low rate of reported drug use, despite the school being located in a drug community.

Implications

Our findings have important implications for future research, clinical practice and policy. Together with Cecil et al., our findings underscore the importance of future studies assessing multiple maltreatment types concurrently in order to account for the cumulative effects and shared variance between them. Moreover, the particularly detrimental effect of emotional abuse on mental health warrants further investigation in order to identify underlying mechanisms and the specific risk factors involved. In terms of clinical practice, our results suggest an urgent need to educate clinicians about key findings. Firstly, because multi-type maltreatment may be more common than the experience of single forms of maltreatment, clinicians should aim to perform a comprehensive screen for different forms of abuse and neglect, bearing in mind that a higher number of maltreatment types experienced is likely to relate to a more severe clinical presentation. Secondly, clinicians should also be informed regarding the key role of emotional abuse in the manifestation of a broad range of adverse outcomes in terms of risk assessment. Thirdly, our findings suggest the need to develop more comprehensive multi-risk clinical assessments which consider current levels of adversity (e.g. peer victimization, community violence exposure), in addition to past experiences. Fourthly, in terms of interventions, it would be useful to assess the effectiveness of promoting strategies designed to foster parental warmth, parenting skills and positive parent-child interactions. These may be particularly effective in neutralizing the consequences of emotional abuse and preventing future experience of victimization (Iwaniec, Larkin, & McSherry, 2007; Cecil et al., 2017). Given that emotional abuse may impact individual functioning mainly by disrupting the developing self-system, tailored programs that help to construct children's self-esteem and self-image may be critical in reducing risk for mental health problems, especially internalizing difficulties (Doyle, 2003; Briere &

Runtz, 1990; de Oliveira et al, 2015). Finally, in terms of policy, our results suggest that greater attention should be paid to the negative effects of emotional abuse upon mental health. Traditionally, physical and sexual abuse has tended to dominate child care policy with the detrimental effects of emotional abuse not being fully realized.

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Table 1. Descriptive statistics and correlations across study variables.

Variables	Mean (SD) or %	Maltreatment types					
		Emotional Abuse	Physical Abuse	Sexual Abuse	Emotional Neglect	Physical neglect	Total Maltreatment
Sociodemographic variables							
Ethnicity[a]							
Black	43.50%	-.10	.04	-.01	.03	.09	-.01
White	8.50%	.07	-.05	.02	-.01	-.09	.01
Mixed	35.80%	-.01	-.10	-.03	-.05	-.03	-.05
Asian	4.10%	.04	.12*	.06	.04	-.05	.05
Amerindian	3.60%	.15**	.09	.03	.01	.01	.09
Gender[b] (female)	47.60%	-.22***	-.07	.03	-.05	.09	-.09
Age	13.28 (1.52)	.18***	.12*	.07	.06	-.02	.12*
Living condition	7.01 (2.42)	.00	-.03	-.03	-.13*	-.13*	-.10
Peer victimization							
As victim	.39 (.71)	.26***	.30***	.23***	.15**	.16***	.29***
As perpetrator	.37 (.89)	.18***	.28***	.27***	.14*	.15**	.26***
Psychiatric symptoms							
Informant report							
Internalizing problems	11.56 (8.51)	.17***	.04	-.03	.09	.09	.13*
Externalizing problems	10.29 (8.43)	.18***	.10	-.002	.12	.08	.19***
Self-report							
Internalizing problems							
Depression	5.94 (5.66)	.57***	.43***	.37***	.34***	.19***	.56***
Anxiety	27.39 (12.12)	.38***	.28***	.18***	.04	.05	.25***
Externalizing problems							
Alcohol use	.35 (.64)	.34***	.28***	.13*	.15**	.10	.29***

N.B. Bivariate (unadjusted) correlations significant at: *$p < .05$, **$p < .01$, ***$p < .001$. Pearson product-moment correlation coefficients are shown for continuous study variables and point-biserial correlation coefficients for binary variables. [a]All ethnicities coded as: yes= 1; no= 0; [b]Gender: 0= Female; 1= Male.

Table 2. Intercorrelations between maltreatment types.

Maltreatment subtype	M *(SD)*	1	2	3	4
1. Emotional abuse	8.32 (4.08)	-			
2. Physical abuse	6.16 (2.14)	.44**	-		
3. Sexual abuse	5.35 (1.38)	.29**	.42**	-	
4. Emotional neglect	10.28 (4.82)	.33**	.22**	0.05	-
5. Physical neglect	7.28 (2.70)	.14**	.22**	.23**	.38**

N.B. Pearson product-moment correlation coefficients significant at $*p < 0.05$, $**p < 0.01$.

Table 3. Frequency of maltreatment exposure.

Maltreatment type[a]	CTQ threshold			
	None	Low	Moderate	Severe
	% *(N)*	% *(N)*	% *(N)*	% *(N)*
Emotional abuse	63.7 (221)	20.5 (71)	8.1 (28)	7.8 (27)
Physical abuse	85.0 (295)	8.1 (28)	4.3 (15)	2.6 (9)
Sexual abuse	89.0 (309)	4.9 (17)	5.5 (19)	.6 (2)
Emotional neglect	54.8 (190)	25.9 (90)	9.5 (33)	9.8 (34)
Physical neglect	59.7 (207)	23.9 (83)	10.5 (38)	5.5. (19)
Number of types[b]				Maltreated youth
1				38.1 (95)
2				35.7 (89)
3				14.8 (37)
4				9.2 (23)
5				2.0 (5)

[a] Proportion of youth who are classified as having experienced None, Low, Moderate or Severe maltreatment based on CTQ thresholds. N = 347.

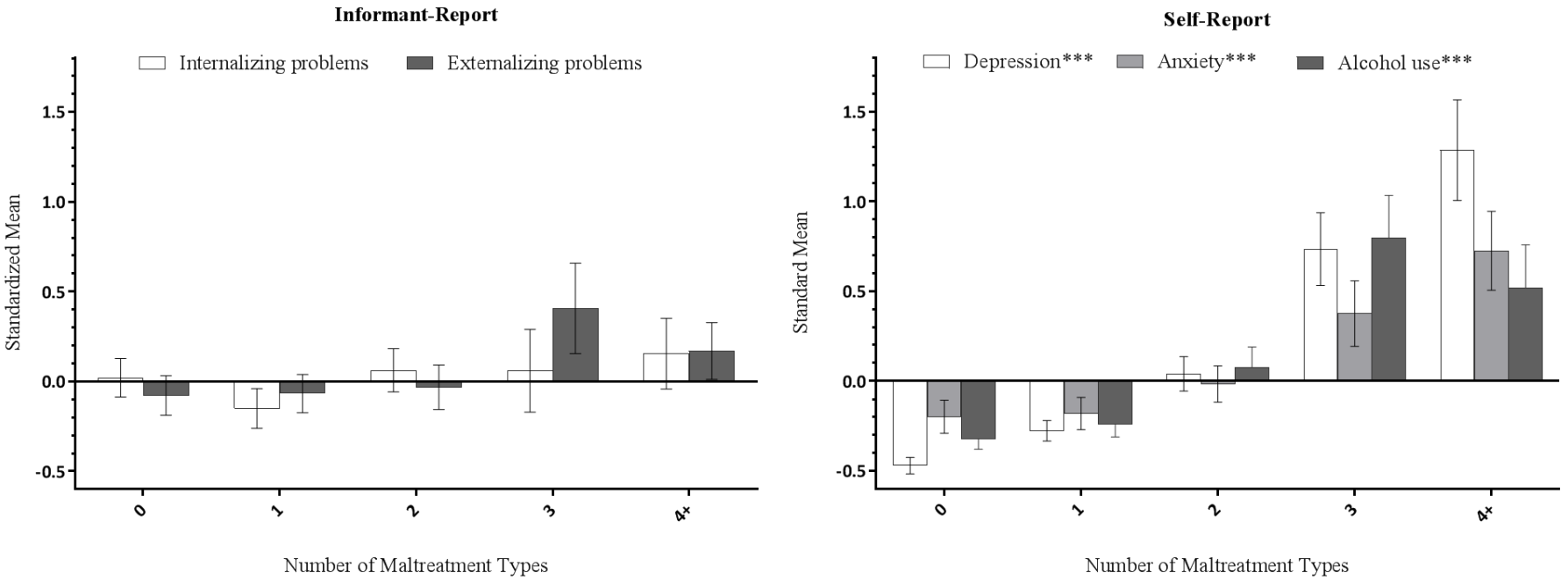
[b] Proportion of maltreated youth who have experienced 1 to 5 forms of maltreatment at or above Low maltreatment threshold. N = 249.

Table 4. Associations between maltreatment types and psychiatric symptoms.

	Regression models							
	Individual				Simultaneous			
	B	*(Std B)*	95% CI		*B*	*(Std B)*	95% CI	
Psychiatric symptoms			LL	UL			LL	UL
Informant report								
Internalizing								
Emotional abuse	.37**	.18	.11	.62	.42**	.20	.12	.73
Physical abuse	.13	.03	-.38	.65	-.12	-.03	-.75	.52
Sexual abuse	-.21	-.04	-.91	.49	-.63	-.11	-1.45	.19
Emotional neglect	.34	.11	-.06	.74	.30	.10	-.13	.74
Physical neglect	.19	.11	-.03	.41	.02	.01	-.23	.27
Externalizing								
Emotional abuse	.35**	.17	.10	.61	.31*	.15	.01	.61
Physical abuse	.35	.09	-.15	.86	.18	.04	-.44	.80
Sexual abuse	-.12	-.02	-.81	.56	-.59	-.11	-1.40	.22
Emotional neglect	.30	.09	-.10	.69	.16	.05	-.27	.60
Physical neglect	.27*	.15	.05	.48	.13	.07	-.12	.38
Self-report								
Depression								
Emotional abuse	.89***	.62	.75	1.03	.59***	.42	.44	.75
Physical abuse	1.38***	.48	1.07	1.68	.48***	.17	.17	.80
Sexual abuse	1.54***	.40	1.10	1.97	.67***	.17	.26	1.08
Emotional neglect	.51***	.23	.24	.77	-.00	-.00	-.22	.22
Physical neglect	.46***	.39	.33	.60	.24***	.21	.12	.37
Anxiety								
Emotional abuse	1.19***	.39	.84	1.53	1.06***	.35	.66	1.46
Physical abuse	1.91***	.31	1.21	2.61	1.13**	.19	.30	1.96
Sexual abuse	1.69***	.20	.71	2.67	-.03	-.00	-1.12	1.05
Emotional neglect	.42	.09	-.15	1.00	.11	.02	-.46	.68
Physical neglect	.11	.04	-.20	.42	-.32*	-.13	-.65	-.00
Alcohol Use								
Emotional abuse	.05***	.34	.03	.07	.05***	.33	.03	.07
Physical abuse	.05***	.17	.02	.09	.01	.02	-.04	.05
Sexual abuse	.05*	.12	.00	.10	-.00	-.01	-.06	.05
Emotional neglect	.02	.12	.00	.03	-.00	-.01	-.02	.02
Physical neglect	.03	.12	-.00	.05	.01	.05	-.02	.04

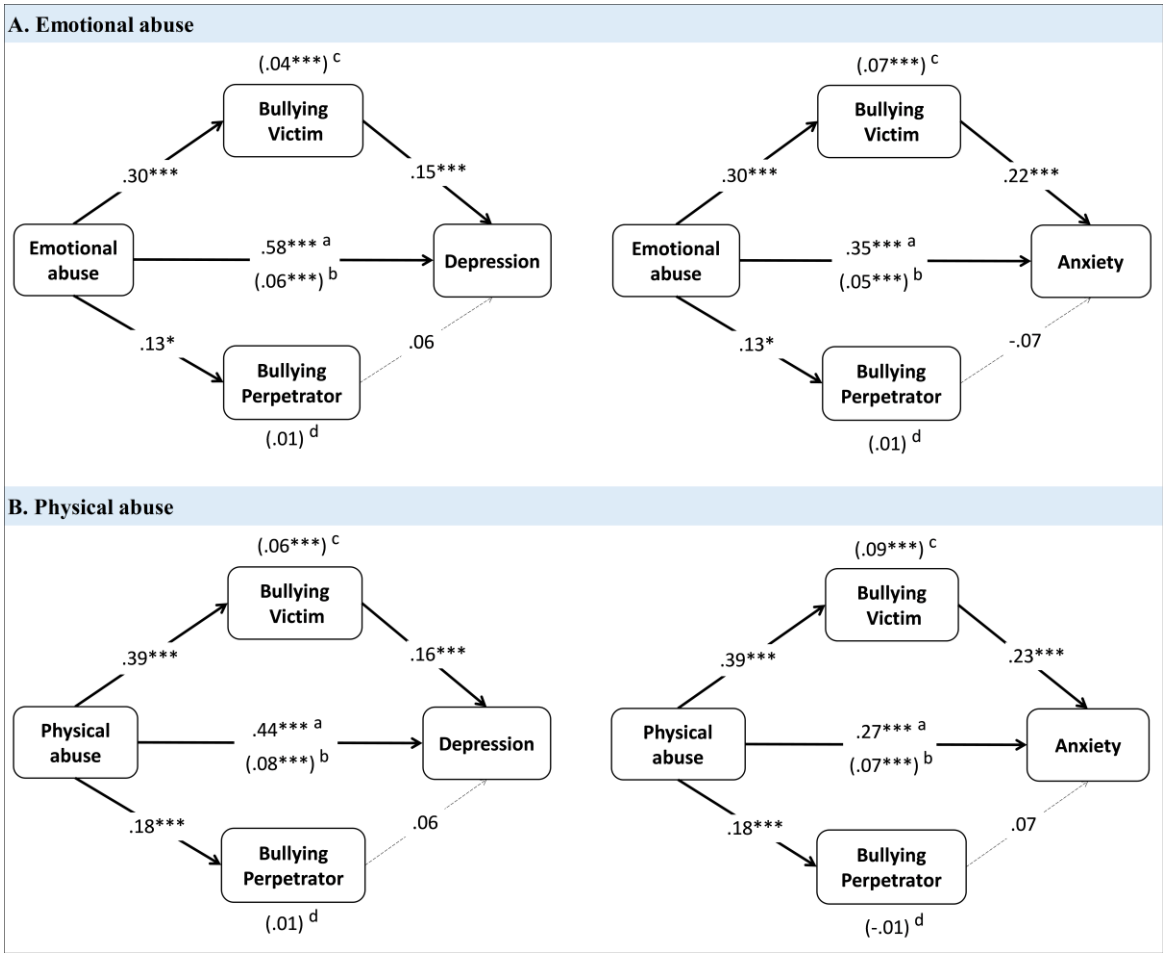
N.B. All models control for gender, ethnicity, age, and living condition. *p <.05, **p < .01, ***p < .001.

Figure 1. Association between number of maltreatment types experienced and symptom severity across mental health domains.



N.B. Asterisks indicate that the main effect of number of maltreatment types on the psychiatric outcome is significant, after controlling for gender, ethnicity, age and current living condition. *p <.05, **p < .01, ***p < .001.

Figure 2. Peer victimization as a mediator in the association between childhood maltreatment and internalizing problems.



N.B. Mediation models with childhood maltreatment as the independent variable (**A.** emotional abuse; **B.** physical abuse), peer victimization as the mediating variable (being a victim of bullying vs. bullying perpetrator), and self-reported internalizing symptoms as the dependent variable (*left hand side*: depression, *right hand side*: anxiety). Standardized regression coefficients are shown for each path, controlling for age, gender, ethnicity, and living conditions. Bold lines indicate that the path is significant, whereas dotted lines indicate non-significant paths. Coefficients for indirect effects are shown in brackets.

[a] Direct effect of maltreatment on outcome; [b] total indirect effect; [c] indirect effect of maltreatment on outcome mediated by being a victim of bullying; [d] indirect effect of maltreatment on outcome mediated by being a bullying perpetrator.

Supplementary Material

Disentangling the mental health impact of childhood abuse and neglect: A replication and extension study in a Brazilian sample of high-risk youth

Supplementary Text. Summary of UK vs. Brazil study characteristics**.**

Key similarities and differences between the characteristics of our study vs that of Cecil et al should be considered when interpreting the present findings. In terms of similarities, both studies examined high-risk youth recruited from deprived urban neighborhoods. Both administered the same self-report instrument of childhood maltreatment (i.e. CTQ), featured multi-informant reports of psychiatric symptomatology (including internalizing and externalizing difficulties), and controlled for socio-demographic characteristics and current living condition. In contrast to Cecil et al, the sample in this study was larger (*n* = 347 *vs.* 204), younger (*age* = 11-17 *vs.* 16-24 years) and recruited within a different cultural, socioeconomic and geopolitical context (Salvador, Brazil *vs.* London, UK). The present study also differed in the source of informant-reports (parent- *vs.* teacher/key-worker) and in the measure of current violence exposure (peer victimization *vs.* CVE). Furthermore, the present study included a wider range of psychiatric outcomes (e.g. alcohol use) compared to the UK study, as well as enabling a more fine-grained assessment of internalizing difficulties (i.e. multiple forms of anxiety and depression). Consequently, the overall characteristics of the two studies allowed for a combination of 'exact' (i.e. same analytic routine and maltreatment measure) and 'conceptual' replication (i.e. sample-specific confounding, partially overlapping raters and outcomes).

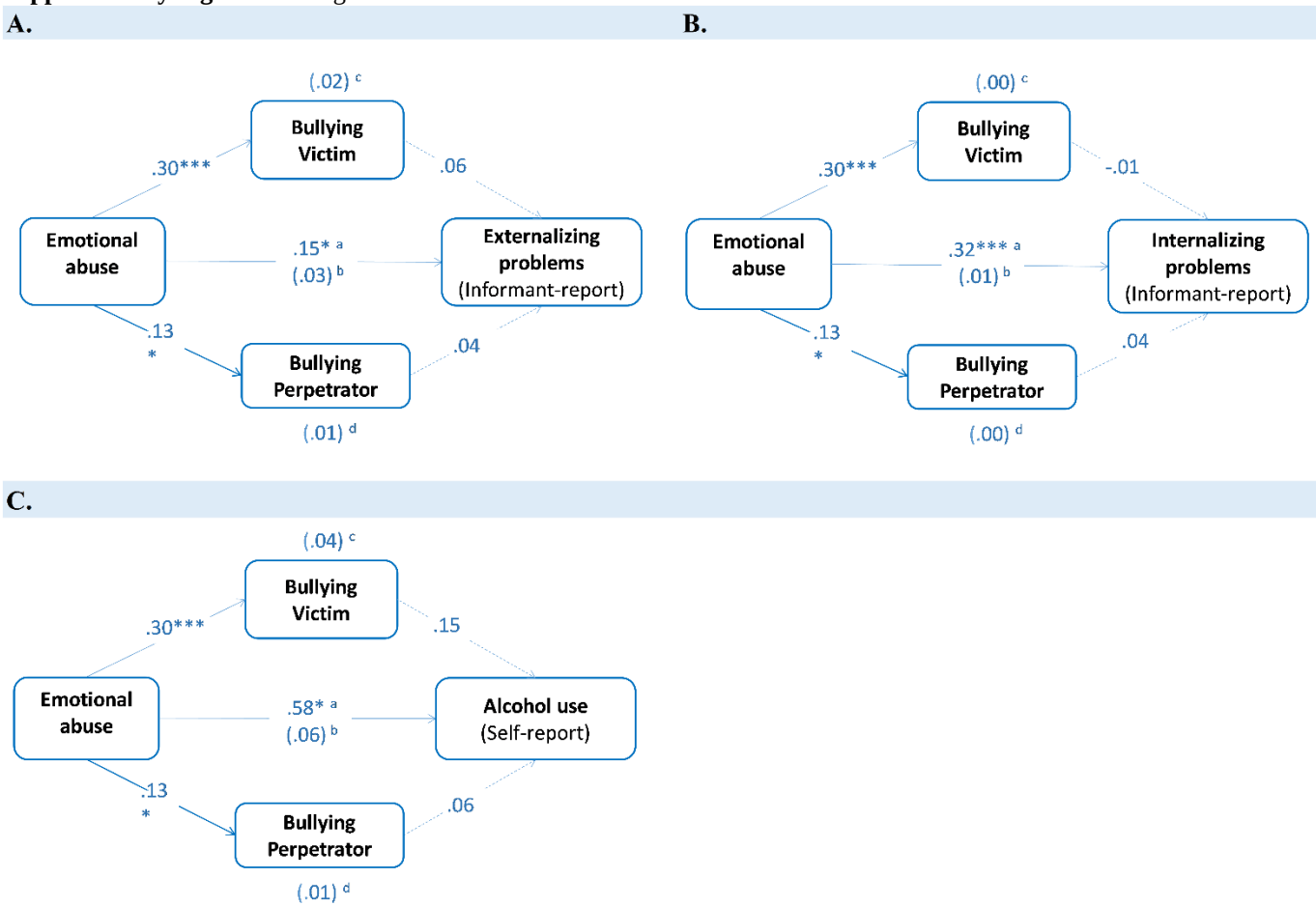
Supplementary Table. Associations between maltreatment types and forms of internalizing and externalizing psychopathologies

	Regression models							
	Individual				Simultaneous			
	B	Std B	95% CI		B	Std B	95% CI	
Psychiatric symptoms			LL	UL			LL	UL
Parent report								
Affective problems								
Emotional abuse	0.19***	0.21	0.08	0.30	0.18**	0.20	0.05	0.32
Physical abuse	0.13	0.07	-0.09	0.35	-0.00	-0.00	-0.27	0.27
Sexual abuse	-0.04	-0.02	-0.34	0.27	-0.23	-0.09	-0.58	0.12
Physical neglect	0.14	0.10	-0.04	0.31	0.07	0.05	-0.12	0.26
Emotional neglect	0.13	0.17	0.04	0.23	0.07	0.09	-0.04	0.17
Anxiety problems								
Emotional abuse	0.05	0.09	-0.02	0.12	0.05	0.09	-0.04	0.14
Physical abuse	0.03	0.03	-0.11	0.17	-0.04	-0.04	-0.22	0.13
Sexual abuse	0.06	0.04	-0.13	0.25	0.01	0.01	-0.21	0.24
Physical neglect	0.08	0.10	-0.03	0.19	0.08	0.09	-0.04	0.20
Emotional neglect	0.02	0.05	-0.04	0.08	-0.00	-0.01	-0.07	0.07
Somatic problems								
Emotional abuse	0.04	0.08	-0.02	0.11	0.06	0.12	-0.02	0.14
Physical abuse	-0.03	-0.03	-0.16	0.10	-0.07	-0.07	-0.23	0.09
Sexual abuse	-0.05	-0.04	-0.22	0.12	-0.07	-0.05	-0.28	0.14
Physical neglect	0.041	0.052	-0.06	0.14	0.05	0.06	-0.06	0.16
Emotional neglect	0.02	0.04	-0.04	0.07	-0.00	-0.00	-0.07	0.06
ADHD								
Emotional abuse	0.13*	0.16	0.03	0.23	0.05	0.06	-0.07	0.17
Physical abuse	0.28**	0.17	0.08	0.48	0.16	0.10	-0.09	0.41
Sexual abuse	0.25	0.11	-0.03	0.52	0.06	0.03	-0.27	0.38
Physical neglect	0.18*	0.14	0.02	0.33	0.08	0.07	-0.09	0.26
Emotional neglect	0.11*	0.15	0.02	0.19	0.06	0.08	-0.04	0.16
Oppositional problems								
Emotional abuse	0.10*	0.17	0.026	0.174	0.09*	0.15	0.00	0.18
Physical abuse	0.10	0.08	-0.05	0.25	0.05	0.04	-0.13	0.23
Sexual abuse	-0.04	-0.02	-0.24	0.16	-0.18	-0.11	-0.42	0.05
Physical neglect	0.11	0.12	-0.00	0.23	0.08	0.09	-0.04	0.21
Emotional neglect	0.07*	0.15	0.01	0.14	0.03	0.05	-0.04	0.10
Conduct problem								
Emotional abuse	0.08	0.10	-0.02	0.18	0.06	0.07	-0.06	0.17

Physical abuse	0.10	0.07	-0.09	0.30	0.10	0.06	-0.14	0.34
Sexual abuse	-0.11	-0.05	-0.38	0.15	-0.25	-0.11	-0.56	0.07
Physical neglect	0.07	0.06	-0.08	0.23	0.02	0.02	-0.14	0.19
Emotional neglect	0.10*	0.15	0.02	0.19	0.07	0.11	-0.02	0.17
Self-report								
Panic/Somatic								
Emotional abuse	0.45***	0.39	0.32	0.58	0.35***	0.31	0.20	0.51
Physical abuse	0.75***	0.33	0.48	1.01	0.46**	0.20	0.14	0.77
Sexual abuse	0.56***	0.18	0.18	0.93	-0.08	-0.03	-0.50	0.33
Physical neglect	0.23*	0.13	0.01	0.44	0.05	0.03	-0.17	0.27
Emotional neglect	0.15*		0.03	0.26	-0.01	-0.01	-0.13	0.12
GAD								
Emotional abuse	0.38**	0.42	0.28	0.49	0.40***	0.43	0.27	0.52
Physical abuse	0.50***	0.25	0.24	0.68	0.19	0.11	-0.06	0.45
Sexual abuse	0.41**	0.16	0.11	0.71	-0.06	-0.02	-0.39	0.28
Physical neglect	0.07	0.05	-0.11	0.24	-0.01	-0.01	-0.18	0.17
Emotional neglect	0.02	0.02	-0.08	0.11	-0.11*	-0.14	-0.21	-0.01
Separation anxiety								
Emotional abuse	0.15***	0.20	0.06	0.24	0.13*	0.17	0.03	0.23
Physical abuse	0.37***	0.24	0.20	0.54	0.27*	0.18	0.06	0.48
Sexual abuse	0.43***	0.21	0.19	0.66	0.11	0.05	-0.16	0.38
Physical neglect	0.09	0.08	-0.05	0.23	0.08	0.07	-0.06	0.23
Emotional neglect	-0.07	-0.11	-0.15	0.00	-0.15***	-0.24	-0.23	-0.07
Social anxiety								
Emotional abuse	0.13**	0.16	0.03	0.23	0.16**	0.20	0.04	0.27
Physical abuse	0.14	0.09	-0.05	0.33	0.11	0.07	-0.13	0.35
Sexual abuse	0.02	0.01	-0.25	0.28	-0.17	-0.08	-0.48	0.14
Physical neglect	-0.03	-0.03	-0.18	0.12	-0.04	-0.04	-0.21	0.12
Emotional neglect	-0.01	-0.01	-0.09	0.07	-0.05	-0.08	-0.15	0.04
School avoidance								
Emotional abuse	0.08***	0.22	0.04	0.13	0.05	0.12	-0.01	0.10
Physical abuse	0.19***	0.26	0.10	0.28	0.10	0.14	-0.01	0.21
Sexual abuse	0.23***	0.23	0.11	0.35	0.11	0.11	-0.03	0.25
Physical neglect	0.07*	0.13	0.00	0.14	0.03	0.05	-0.05	0.10
Emotional neglect	0.02	0.08	-0.02	0.06	-0.01	-0.02	-0.05	0.04

N.B. All models control for sex, ethnicity, age, and living condition. *p <.05, **p < .01, ***p < .001.

Supplementary Figure. Non-significant mediation models



N.B. Mediation models with emotional abuse as the independent variable, peer victimization as the mediating variable (being a victim of bullying vs. bullying perpetrator), and psychiatric symptoms as the dependent variable (**A.** informant-rated externalizing symptoms; **B**. informant-rated internalizing symptoms; **C.** self-report alcohol use). Standardized regression coefficients are shown for each path, controlling for age, gender, ethnicity, and living conditions. Bold lines indicate that the path is significant, whereas dotted lines indicate non-significant paths. Coefficients for indirect effects are shown in brackets. [a] Direct effect of maltreatment on outcome; [b] total indirect effect; [c] indirect effect of maltreatment on outcome mediated by being a victim of bullying; [d] indirect effect of maltreatment on outcome mediated by being a bullying perpetrator.